TH 130 MINI STEAM TURBINE POWER PLANT

GENERAL DESCRIPTION

This equipment is designed as a miniature modern day power plant for educational purpose.

A hand feed pump supplies water from a feed tank to a small gas fired boiler where steam is further heated by optional super heater. The steam is throttled to single stage turbine via a nozzle. Exhaust from the turbine is condensed in a water cooled condenser. Condensate is collected for weight measurement and is returned to feed water tank. A small DC generator is connected to the turbine by a belt, and small light bulbs as are provided as electrical load.

Instruments are provided for monitoring and controlling of plant operation and performance as well as for safety. The unit is with adjustable footings.

Photograph includes optional equipment

TYPICAL EXPERIMENTS

- Thermodynamic process.
- Fuel consumption.
- Power generation.
- Efficiencies for boiler, turbine, condenser heat transfer, and overall plant.
- Heat balance and energy utilization.

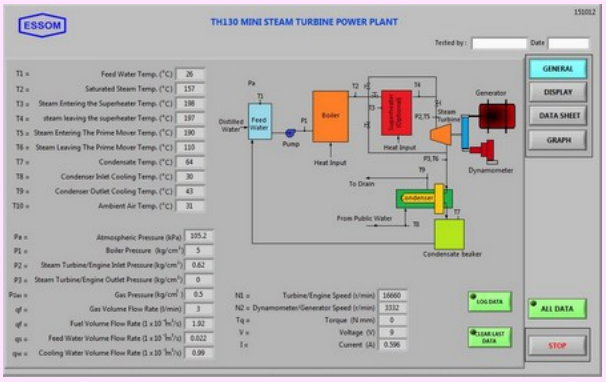
TECHNICAL DATA

• Boiler	
- Type	: Fire tube vertical boiler.
- Steam rate	: Upto 7 kg/hr
- Pressure	: Upto 0.5 MPa gauge.
• Boiler accessories	: Safety valve, level gauge.
• Fuel	: Liquefied Petroleum Gas (LPG).
• Feed water tank	: Stainless steel with level gauge.
• Feed pump	: Hand operated.
• Steam turbine	
- Type	: Single stage impulse turbine, single nozzle.
• Power output measurements	: Mechanical brake dynamometer.
• Electrical power system	: DC generator with lamp loads.
• Condenser	: Shell and tube type.
• Plant output	
- Without super heater	: Mechanical approx 12W.
	: Electrical approx 4W.
- With super heater (optional)	: Mechanical approx 18W.
	: Electrical approx 6W.
• Safety features	
- Turbine speed limit.	
- Emergency switch.	
• Measuring instruments	
- Pressures gauge	: 1 ea.
- Temperatures	: 7 ea.
- Flow meters	: 2 ea.
- Turbine speed and dynamometer torque	: Digital display.
- Graduated cylinder, and stop watch for condensate measurement.	
- Voltage and current digital display.	
• Accessory	: Boiler cleaning kits.
• Power supply	: 220V 1Ph 50Hz. Other power supply is available on request.

OPTIONAL EQUIPMENT

- Electric boiler instead of LPG boiler.
- Gas Fired Super heater.
  - Capacity : Upto 40ºC superheated.
  - Fuel : LPG
  - Typical experiment : Effect of super heated steam on efficiency.
- Electric Super heater.
- TH 130-050 Computer Interface

This includes sensors, computer interface unit, and software for relevant data display and analysis by computer (separately supplied).



Net (unpacked) shipping dimensions WxLxH : 70 x 122 x 155 cm
Net weight : Approx. 105 kg

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